

WHAT IS CLAIMED IS:

1. 1. An ink jet recording apparatus comprising:
  2. a recording head provided with a pressure generating element;
  3. a scanning mechanism for moving the recording head in a main scanning direction;
  5. a data developer for developing print data into jetting data;
  6. a drive signal generator for generating a drive signal including a plurality of drive pulses, on every unit print cycle;
  8. a translator for translating the jetting data into pulse select information associated with the respective drive pulses;
  10. a drive pulse supplier for selectively supplying at least one of the drive pulses to the pressure generating element in accordance with the pulse select information to drive the pressure generating element;
  13. a basic recording mode for recording through use of a basic unit pixel which is associated with a unit recording area corresponding to the unit print cycle;
  16. a high-resolution recording mode for recording through use of a fine unit pixel, a plurality of fine unit pixels being arranged within the unit recording area in the main scanning direction; and
  19. a mode selector for selecting one of plural recording modes including the basic recording mode and the high-resolution recording mode,
  21. wherein the data developer develops the print data into the jetting data such that each bit therein indicates whether the recording is conducted or not in each associated fine unit pixel, when the mode selector selects the

24 high-resolution recording mode.

1       2.       The ink jet recording apparatus as set forth in claim 1, wherein the  
2       data developer develops the print data into the jetting data such that bits  
3       therein indicate gradation recorded in the unit recording area, when the mode  
4       selector selects the basic recording mode.

1       3.       The ink jet recording apparatus as set forth in claim 1, wherein the  
2       translator is provided with waveform select tables associated with the  
3       respective recording modes;

4               wherein each of the waveform select table defines a correspondence  
5       between the jetting data and the pulse select information in the associated  
6       recording mode; and

7               wherein the translator translates the jetting data into the pulse select  
8       information with reference to the waveform select table of the recording mode  
9       selected by the mode selector.

1       4.       The ink jet recording apparatus as set forth in claim 3, wherein the  
2       waveform select table is rewritable.

1       5.       The ink jet recording apparatus as set forth in claim 1, wherein the  
2       mode selector selects the recording mode in accordance with the print data.

1       6.       The ink jet recording apparatus as set forth in claim 1, wherein the  
2       plural drive pulses are of an identical profile.

1       7.       The ink jet recording apparatus as set forth in claim 1, wherein the  
2       plural drive pulses are spaced at constant intervals within the unit print cycle.

1       8.       The ink jet recording apparatus as set forth in claim 1, wherein an  
2       initial trigger for starting the unit print cycle is derived from the scanning  
3       mechanism.

1       9.       An ink jet recording apparatus comprising:  
2                a recording head provided with a pressure generating element;  
3                a scanning mechanism for moving the recording head in a main  
4       scanning direction;  
5                a drive signal generator for generating a drive signal including a  
6       plurality of drive pulses, on every unit print cycle;  
7                a drive pulse supplier for selectively supplying at least one of the drive  
8       pulses to the pressure generating element in accordance with print data, to  
9       drive the pressure generating element; and  
10          a high-resolution recording mode for recording through use of a fine  
11       unit pixel, a plurality of fine unit pixels being arranged in the main scanning  
12       direction within a unit recording area corresponding to the unit print cycle,  
13          wherein the drive pulse supplier divides the drive pulses in the drive  
14       signal into a plurality of groups each including a same number of the drive  
15       pulses such that the last drive pulse included in a group used for a fine unit  
16       pixel to be recorded previously is also included in a group used for a fine unit  
17       pixel to be recorded subsequently, and supplies the drive pulses included in at

18 least one of the groups to the pressure generating element.

1 10. The ink jet recording apparatus as set forth in claim 9, further  
2 comprising:

3 a basic recording mode for recording through use of a basic unit pixel  
4 which is associated with the unit recording area; and

5 a mode selector for selecting one of the basic recording mode and the  
6 high-resolution recording mode.

1 11. The ink jet recording apparatus as set forth in claim 9, wherein the  
2 plural drive pulses are of an identical profile.

1 12. The ink jet recording apparatus as set forth in claim 9, wherein the  
2 plural drive pulses are spaced at constant intervals within the unit print cycle.

1 13. The ink jet recording apparatus as set forth in claim 10, wherein the  
2 print data includes gradation information; and

3 wherein the drive pulse supplier changes the number of drive pulse to  
4 be supplied to the pressure generating element in accordance with the  
5 gradation information under the basic recording mode.

1 14. The ink jet recording apparatus as set forth in claim 9, wherein the  
2 drive pulse supplier is provided with a waveform select table in which a  
3 correspondence between the jetting data and the selected drive pulse.

1       15.     The ink jet recording apparatus as set forth in claim 14, wherein the  
2     waveform select table is rewritable.

1       16.     The ink jet recording apparatus as set forth in claim 10, wherein the  
2     drive pulse supplier is provided with waveform select tables associated with  
3     the respective recording modes; and

4                wherein each of the waveform select table defines a correspondence  
5     between the jetting data and the selected drive pulse in the associated  
6     recording mode.

1       17.     The ink jet recording apparatus as set forth in claim 16, wherein the  
2     waveform select table is rewritable.

1       18.     The ink jet recording apparatus as set forth in claim 9, wherein an  
2     initial trigger for starting the unit print cycle is derived from the scanning  
3     mechanism.

1       19.     An ink jet recording apparatus comprising:  
2                a recording head provided with a pressure generating element;  
3                a scanning mechanism for moving the recording head in a main  
4     scanning direction;  
5                a drive signal generator for generating a drive signal including a  
6     plurality of drive pulses, on every unit print cycle;  
7                a drive pulse supplier for selectively supplying at least one of the drive  
8     pulses to the pressure generating element in accordance with print data, to

9       drive the pressure generating element; and

10            a high-resolution recording mode for recording through use of a fine  
11       unit pixel, a plurality of fine unit pixels being arranged in the main scanning  
12       direction within a unit recording area corresponding to the unit print cycle,  
13            wherein the drive pulse supplier divides the drive pulses in the drive  
14       signal into a plurality of groups each including a same number of the drive  
15       pulses such that at least one drive pulse is interposed between a group used  
16       for a fine unit pixel to be recorded previously and a group used for a fine unit  
17       pixel to be recorded subsequently, and supplies the drive pulses included in at  
18       least one of the groups to the pressure generating element; and  
19            wherein the drive pulse supplier also supplies the interposed drive  
20       pulse to the pressure generating element when both of the groups used for the  
21       previous fine unit pixel and the subsequent fine unit pixel.

1       20.      The ink jet recording apparatus as set forth in claim 19, further  
2       comprising:

3            a basic recording mode for recording through use of a basic unit pixel  
4       which is associated with the unit recording area; and

5            a mode selector for selecting one of the basic recording mode and the  
6       high-resolution recording mode.

1       21.      The ink jet recording apparatus as set forth in claim 19, wherein the  
2       plural drive pulses are of an identical profile.

1       22.     The ink jet recording apparatus as set forth in claim 19, wherein the  
2     plural drive pulses are spaced at constant intervals within the unit print cycle.

1       23.     The ink jet recording apparatus as set forth in claim 20, wherein the  
2     print data includes gradation information; and

3               wherein the drive pulse supplier changes the number of drive pulse to  
4     be supplied to the pressure generating element in accordance with the  
5     gradation information under the basic recording mode.

1       24.     The ink jet recording apparatus as set forth in claim 19, wherein the  
2     drive pulse supplier is provided with a waveform select table in which a  
3     correspondence between the jetting data and the selected drive pulse.

1       25.     The ink jet recording apparatus as set forth in claim 24, wherein the  
2     waveform select table is rewritable.

1       26.     The ink jet recording apparatus as set forth in claim 20, wherein the  
2     drive pulse supplier is provided with waveform select tables associated with  
3     the respective recording modes; and

4               wherein each of the waveform select table defines a correspondence  
5     between the jetting data and the selected drive pulse in the associated  
6     recording mode.

1       27.     The ink jet recording apparatus as set forth in claim 26, wherein the  
2     waveform select table is rewritable.

1       28.     The ink jet recording apparatus as set forth in claim 19, wherein an  
2 initial trigger for starting the unit print cycle is derived from the scanning  
3 mechanism.

1       29.     An ink jet recording apparatus comprising:  
2              a recording head provided with a pressure generating element;  
3              a scanning mechanism for moving the recording head in a main  
4 scanning direction;  
5              a drive signal generator for generating a drive signal including a  
6 plurality of drive pulses, on every unit print cycle;  
7              a drive pulse supplier for selectively supplying at least one of the drive  
8 pulses to the pressure generating element in accordance with print data, to  
9 drive the pressure generating element; and  
10          a high-resolution recording mode for recording through use of a fine  
11 unit pixel, a plurality of fine unit pixels being arranged in the main scanning  
12 direction within a unit recording area corresponding to the unit print cycle, the  
13 high-resolution recording mode including:  
14              a first high-resolution recording mode in which the drive  
15 pulse supplier divides the drive pulses in the drive signal into a plurality of  
16 groups each including a same number of the drive pulses such that the last  
17 drive pulse included in a group used for a fine unit pixel to be recorded  
18 previously is also included in a group used for a fine unit pixel to be recorded  
19 subsequently; and supplies the drive pulses included in at least one of the  
20 groups to the pressure generating element; and

21                   a second high-resolution recording mode in which the drive  
22 pulse supplier divides the drive pulses in the drive signal into a plurality of  
23 groups each including a same number of the drive pulses such that at least  
24 one drive pulse is interposed between a group used for a fine unit pixel to be  
25 recorded previously and a group used for a fine unit pixel to be recorded  
26 subsequently, and supplies the drive pulses included in at least one of the  
27 groups to the pressure generating element, and the drive pulse supplier also  
28 supplies the interposed drive pulse to the pressure generating element when  
29 both of the groups used for the previous fine unit pixel and the subsequent fine  
30 unit pixel; and

31                   mode selector for selecting one of a plurality of recording modes  
32 including the first high-resolution recording mode and the second  
33 high-resolution recording mode.

1       30.       The ink jet recording apparatus as set forth in claim 29, further  
2 comprising a basic recording mode for recording through use of a basic unit  
3 pixel which is associated with the unit recording area.

1       31.       The ink jet recording apparatus as set forth in claim 29, wherein the  
2 plural drive pulses are of an identical profile.

1       32.       The ink jet recording apparatus as set forth in claim 29, wherein the  
2 plural drive pulses are spaced at constant intervals within the unit print cycle.

1       33.     The ink jet recording apparatus as set forth in claim 30, wherein the  
2     print data includes gradation information; and

3               wherein the drive pulse supplier changes the number of drive pulse to  
4     be supplied to the pressure generating element in accordance with the  
5     gradation information under the basic recording mode.

1       34.     The ink jet recording apparatus as set forth in claim 29, wherein the  
2     drive pulse supplier is provided with a waveform select table in which a  
3     correspondence between the jetting data and the selected drive pulse.

1       35.     The ink jet recording apparatus as set forth in claim 34, wherein the  
2     waveform select table includes a plurality of tables associated with the  
3     respective recording modes; and

4               wherein each of the waveform select table defines a correspondence  
5     between the jetting data and the selected drive pulse in the associated  
6     recording mode.

1       36.     The ink jet recording apparatus as set forth in claim 34, wherein the  
2     waveform select table is rewritable.

1       37.     The ink jet recording apparatus as set forth in claim 9, wherein an  
2     initial trigger for starting the unit print cycle is derived from the scanning  
3     mechanism.

1       38. An ink jet recording apparatus comprising:

2              a recording head provided with a pressure generating element;

3              a scanning mechanism for moving the recording head in a main

4       scanning direction;

5              a data developer for developing print data into jetting data;

6              a drive signal generator for generating a drive signal including a

7       plurality of drive pulses, on every unit print cycle;

8              a translator for translating the jetting data into pulse select information

9       associated with the respective drive pulses;

10          a drive pulse supplier for selectively supplying at least one of the drive

11       pulses to the pressure generating element in accordance with the pulse select

12       information to drive the pressure generating element;

13          a basic recording mode for recording through use of a basic unit pixel

14       which is associated with a unit recording area corresponding to the unit print

15       cycle;

16          a high-resolution recording mode for recording through use of a fine

17       unit pixel, a plurality of fine unit pixels being arranged within the unit recording

18       area in the main scanning direction; and

19          a mode selector for selecting one of plural recording modes including

20       the basic recording mode and the high-resolution recording mode,

21          wherein the number of gradation level can be recorded in the basic

22       recording mode is larger than the number of gradation level can be recorded in

23       the high-resolution recording mode.

1       39.     A control method comprising the steps of:  
2                 providing an ink jet recording apparatus comprising:  
3                         a recording head provided with a pressure generating  
4                     element;  
5                         a scanning mechanism for moving the recording head in a  
6                     main scanning direction;  
7                         a basic recording mode for recording through use of a basic  
8                     unit pixel which is associated with a unit recording area corresponding to a unit  
9                     print cycle; and  
10                         a high-resolution recording mode for recording through use  
11                     of a fine unit pixel, a plurality of fine unit pixels being arranged within the unit  
12                     recording area in the main scanning direction;  
13                         transmitting print data to the recording apparatus;  
14                         selecting one of plural recording modes including the basic recording  
15                     mode and the high-resolution recording mode, in accordance with the print  
16                     data;  
17                         developing the print data inputted into jetting data;  
18                         generating a drive signal including a plurality of drive pulses, on every  
19                     unit print cycle;  
20                         translating the jetting data into pulse select information associated  
21                     with the respective drive pulses;  
22                         supplying selectively at least one of the drive pulses to the pressure  
23                     generating element in accordance with the pulse select information to drive the  
24                     pressure generating element,  
25                         wherein the print data is developed into the jetting data such that

26 each bit therein indicates whether the recording is conducted or not in each  
27 associated fine unit pixel, when the high-resolution recording mode is selected.

1 40. A computer-readable recording medium for storing program a  
2 program to control an ink jet recording apparatus comprising:

3                   a recording head provided with a pressure generating  
4 element;

5                   a scanning mechanism for moving the recording head in a  
6 main scanning direction;

7                   a basic recording mode for recording through use of a basic  
8 unit pixel which is associated with a unit recording area corresponding to a unit  
9 print cycle; and

10                  a high-resolution recording mode for recording through use  
11 of a fine unit pixel, a plurality of fine unit pixels being arranged within the unit  
12 recording area in the main scanning direction,

13                  the program executing the steps of:

14                  receiving print data;

15                  selecting one of plural recording modes including the basic recording  
16 mode and the high-resolution recording mode in accordance with the print  
17 data;

18                  developing print data into jetting data;

19                  generating a drive signal including a plurality of drive pulses, on every  
20 unit print cycle;

21                  translating the jetting data into pulse select information associated  
22 with the respective drive pulses;

23           supplying selectively at least one of the drive pulses to the pressure  
24       generating element in accordance with the pulse select information to drive the  
25       pressure generating element,

26           wherein the print data is developed into the jetting data such that  
27       each bit therein indicates whether the recording is conducted or not in each  
28       associated fine unit pixel, when the high-resolution recording mode is selected.